

Idaho Standard Practice for**Acceptance Test Strip for Hot Mix Asphalt (HMA) Pavement****Idaho IR-125-11**

1 Scope

1.1 This Standard Practice is used to:

- obtain density gauge readings to establish density gauge correlation factors (State and Contractor)
- obtain cores for determining the density gauge correlation factors
- obtain loose mix samples for test strip acceptance testing (Contractor)
- obtain cold feed aggregate samples for test strip acceptance testing (Contractor)
- confirm the HMA can be compacted to the minimum of 92.0% but not in excess of 96.0% density
- develop a roller pattern to achieve the specified density

2 Reference Documents

2.1 AASHTO

[FOP for T 168](#) - Sampling Bituminous Paving Mixtures

[T 2](#) - Sampling of Aggregates

[FOP for AASHTO T 343](#) – Method C, Density of In-Place Hot Mix Asphalt (HMA) Pavement by Electronic Surface Contact Devices

2.2 WAQTC

[TM 8](#) - In Place Density of Bituminous Mixes Using the Nuclear Moisture-Density Gauge (Backscatter Mode)

[TM11](#) - Field Sampling Bituminous Material after Compaction (Obtaining Cores)

3 Apparatus3.1 Sampling device as specified in FOP for [AASHTO T 168](#)3.2 Density gauge with accessory equipment as specified in [WAQTC TM 8](#) or [FOP for AASHTO T 343](#).

3.3 Coring equipment for collecting six-inch diameter pavement cores

3.4 Approved measuring device capable of measuring test strip length. All apparatus shall be furnished by the Contractor.

4 Terminology4.1 Acceptance Test Strip - One or more Test Sections, the total length not less than 1,000 feet or more than 2500 feet. The Acceptance Test Strip shall be constructed to the same placement width and thickness as the course it represents. ([Figure 1](#))

- 4.2 Test Section - a minimum of 500 feet (continuous) in length within the Acceptance Test Strip, constructed with a single asphalt binder content. A separate Test Section is required for each asphalt binder content used in the Acceptance Test Strip. ([Figure 1](#))
- 4.3 Roller Pass Density - an uncorrected density reading determined using a density gauge in backscatter mode following a roller pass. The Roller Pass Density shall consist of one one-minute count with the density gauge placed parallel to the direction of travel. Filler material is not required and a core correlation will not be applied to these density readings.
- 4.4 Maximum Roller Pass Density - the uncorrected density reading following the roller pass which adds no more than 1/2 pound per cubic foot (8 kg/m^3) to the previous density value. This shall be accomplished during the intermediate rolling. Sufficient roller passes shall be made to determine that a "false" break or leveling-off point is not used for the Maximum Roller Pass Density.
- 4.5 Test Site Density - the uncorrected density reading taken on the compacted pavement after finish rolling is complete at a Test Site for correlation to cores. It is obtained by using the test procedure specified in [WAQTC TM 8](#), without applying a gauge correlation factor. Filler material shall be applied before taking Test Site Density readings.
- 4.6 Roller Pass - the passing of the roller over an area (roller width) one time.
- 4.7 Roller Coverage - the rolling of the entire width of the pavement one time, including roller overlap.
- 4.7.1 Breakdown Rolling constitutes the first roller coverage.
- 4.7.2 Intermediate Rolling constitutes all rolling after the breakdown rolling and prior to the mix reaching the minimum temperature specified by the contract for such rolling.
- 4.7.3 Finish Rolling constitutes the roller coverage, after intermediate rolling, required to bring the mix into a smooth, tight, hard surface without the presence of fatigue or cold-brittle cracking.
- 4.8 Roller Pattern - the number of roller passes necessary to achieve the specified density.
- 4.9 Stratified Random Sampling of HMA - method used to ensure the specimens for the sample are obtained from throughout the Test Section, and are not concentrated in one portion of the Test Section. All sample locations will be determined by the Engineer using a random sampling system.


5 Procedure

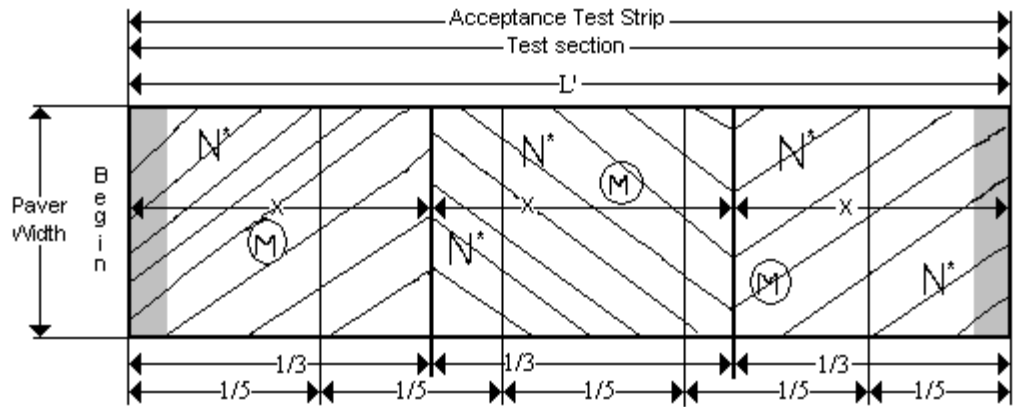
- 5.1 An Acceptance Test Strip shall be constructed after a uniform asphalt mix is being produced. The Acceptance Test Strip may be constructed using one or more Test Sections. The asphalt binder content of each Test Section must meet all specification requirements.
- 5.2 The Contractor shall obtain cold feed aggregate samples in accordance with the Specifications. Sampling will be determined by the Engineer using a random sampling system.
- 5.3 The Contractor shall obtain 3 loose mix samples from each Test Section in accordance with the specifications. Each Test Section will be divided into 3 segments of equal length and a loose mix sample will be obtained randomly from each segment by the contractor for acceptance testing. Exclude the first and last 30 feet of each section when selecting sample locations.
- 5.4 Each test section will be divided into 5 segments of equal length and test sites for cores and density reading will be obtained randomly from each segment. A minimum of five cores will be required to correlate the density gauges for a test strip. (See [WAQTC TM 8](#) or [FOP for AASHTO T 343](#)).
- 5.5 Standardize the density gauge. Refer to [WAQTC TM 8](#) or [FOP for AASHTO T 343](#).
- 5.6 The Contractor shall compact each Test Section and record Roller Pass Densities in at least one location within each Test Section but no less than two per Test Strip. When density gauge readings indicate the Maximum Roller Pass Density has been achieved in a Test Section, compaction shall proceed in turn to each of the remaining Test Sections, if applicable, in the Acceptance Test Strip.

- 5.7 The Contractor shall record the temperature of the pavement following each roller pass to monitor the drop in mix temperature as rolling progresses in at least one location within each Test Section. Temperature readings shall be taken at the mid-point of the depth of pavement being tested.
- 5.8 Upon completion of all Test Sections in the Acceptance Test Strip, Test Site Densities ([Paragraph 4.6](#)) shall be taken for each gauge to be used on the project for Quality Control or Acceptance Testing to determine a correlation factor according to [WAQTC TM 8 or FOP for AASHTO T 343](#). Form [ITD-820](#) will be used by the Contractor and ITD project personnel to record the Test Site Densities for each gauge at each Test Site in each Test Section.
- 5.8.1 A correlation factor is valid only for the particular gauge, gauge thickness settings, gauge mode setting and at the probe depth used in the correlation procedure. Multiple gauges may be correlated from the same series of cores if done at the same time. (See [Note 7, WAQTC TM 8 or FOP for AASHTO T 343](#))
- 5.8.2 Additional core correlation factors may be required to adjust for changes in the HMA pavement.
- 5.8.3 Re-correlation of the gauges is necessary on each lift of pavement.
- 5.9 After the pavement has cooled sufficiently to avoid deformation during coring, the Contractor shall obtain one core at each Test Site in accordance with [WAQTC TM 11](#). Pavement cores shall meet the criteria under the Correlation section of [WAQTC TM 8 or FOP for AASHTO T 343](#).
- 5.10 Off-Site Mix Verification. The Contractor, at no cost to the State, may elect to perform off-site mix design testing for contract requirements at a location and time agreed upon by the Engineer. Off-site mix verification must occur within 14 calendar days prior to the anticipated start of production paving.
- 5.10.1 The off-site mix design verification process will verify aggregate and mix parameters only. All other properties will be determined during a density test strip placed on the prepared surface of the project.
- 5.10.2 The density test strip shall follow the procedure outlined in Subsection 5.8 to 5.9 and Figure 1a. Break-Over patterns, density gauge correlation factors, density acceptance of the placement, and Contractor's workmanship will be verified during the density test strip. The density test strip shall not exceed 1000 feet in length. Production paving shall not begin until an acceptable density test strip is produced.
- 5.10.3 Materials from Department controlled sources cannot be used for off-site mix design verification. The off-site test strip shall be accessible to ITD personnel at all times. If other than ITD property, written permission from the property owner shall be given for ITD employees to observe the work.

6 Report


- 6.1 The Contractor shall record the location, the number of roller passes, the corresponding Roller Pass Density reading, and pavement temperature following each roller pass in at least one location in each Test Section. This information shall be recorded on Form [ITD-891](#) ([Figure 2](#)).
- 6.2 The Contractor shall plot Roller Pass Density readings and temperatures vs. roller passes on Form [ITD-891](#) concurrently with the rolling. A copy of each completed [ITD-891](#) shall be furnished to the Engineer upon completion of finish rolling.
- 6.3 From the cores, the Engineer will determine the density gauge correlation factors for each State gauge and core densities, percent compaction for each Test Section. Laboratory core test results will be provided to the Contractor prior to the start up of production paving for correlation of Contractor gauges. Density gauge correlation data shall be recorded on Form [ITD-820](#) for each gauge.

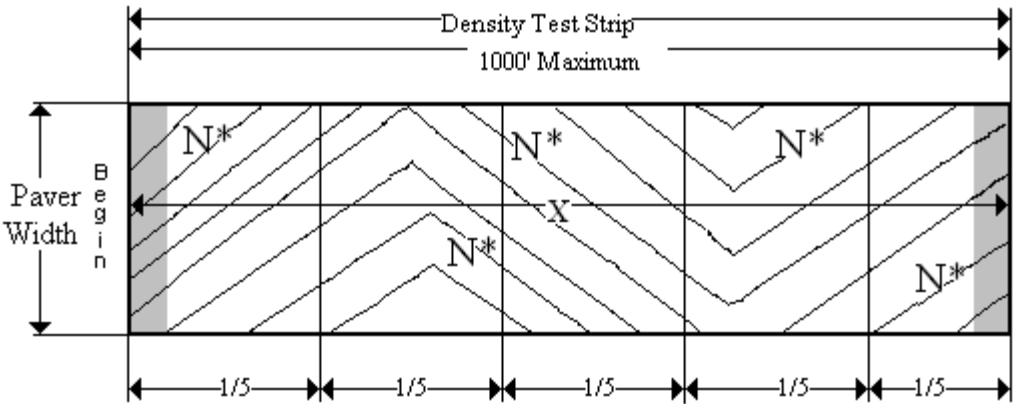
| L' | X | N* | * | (M) |  |
|--|--------------------------------------|--|---------------------------------------|--|---|
| Test Section Length (see 4.1 & 4.2) | Number of Roller Passes (see 4.7) | Location of Density Gauge reading (test site) (see 5 Procedure) | Location of Core (see 5 Procedure) | Mix sample location (see 5 Procedure) | Avoid taking samples in these areas. |



Take mix samples at three stratified random locations. Take one core sample from random test sites selected in each of five stratified segments of the Acceptance Test Strip. The Contractor shall obtain three mix samples and five core samples. Exclude the first and last 30' sections from the generation of the stratified sections.

Figure 1.

| X | N* |  |
|--------------------------------------|--|--|
| Number of roller passes (See 4.7) | Location of Core and Density Reading (Test Site) (See 5.10) | Avoid taking samples in these locations |



The Contractor shall obtain one core sample from random test sites selected in each of five stratified segments of the Density Test Strip. Exclude the first and last 30' sections from the generation of the stratified sections.

Figure 1a.

Plant Mix Pavement Test Strip Density Worksheet



| | | |
|---------------|-----------|----------------------|
| Tester's Name | WAQTC No. | ITD Inspector's Name |
|---------------|-----------|----------------------|

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